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Not that it is recommended to use the series for computing the value of its sum approximately, but that Liouville¹ has proved the existence of infinitely many transcendental numbers by setting up rapidly convergent numerical series whose sums are transcendental. The present series does not converge as rapidly as those given by him, but it is more rapidly convergent than the exponential series for $x = 1$, which defines the transcendental number e . In fact v_n lies between $2^{(2^n-2)}$ and $2^{(2^n)}$.

AMONG MY AUTOGRAPHS.

By DAVID EUGENE SMITH, Columbia University.

10. DELAMBRE AIDS IN FREEING SPENCER STANHOPE.

Not only was Delambre influential in securing the release of the founder of the Smithsonian Institution from prison in Hamburg, as stated in a preceding article,² and thus in an indirect way in the establishing of the Institution itself, but he was of service to British science and art in performing a similar service for Spencer Stanhope, a young member of the famous Stanhope family and one who at that time gave much promise in antiquarian research.

One of Delambre's letters in my collection reads as follows:

The Perpetual Secretary for mathematical sciences, to His Excellency the Minister of War.
Monsieur Le Duc,

A young Englishman, M. Spencer Stanhope, made a prisoner of war through a series of unhappy circumstances surrounding his peaceful voyage to Greece, has begged the Imperial Institute to interest itself in his favor with respect to Your Excellency.

The research which M. Stanhope is undertaking is concerned particularly with antiquities, and this is the reason which has determined the Class of Ancient Languages to recommend to Your Excellency the [favorable consideration of the] petition of this young traveler. He also includes in his plan the rendering of aid to geography, to astronomy, and to all the sciences; he is supplied with telescopic octants and he proposes in his travels to join certain geographers with whom he expects to work in Greece and the adjoining countries. His undertaking will be of service to practically all Classes and sections of the Imperial Institute. He goes out from England in search of new information which he proposes to take back for the common advantage of all civilized nations. The Imperial Institute, in applauding his designs, believes that it participates in the intentions of a generous government in recommending to Your Excellency the [granting of the] request of M. Stanhope, who earnestly desires that he may be permitted to continue the voyage so unhappily interrupted.

I am, with respect, Monsieur Le Duc,
Your Excellency's very humble and
very obedient servant,

DELAMBRE.

The letter bears an official memorandum of reference to the same official as the one relating to James Smithson, and doubtless was equally successful in accomplishing its purpose.

11. VOLTAIRE AND MATHEMATICS.

Of those who admire that greatest champion of popular liberty in the eighteenth century, it is not probable that one in a thousand connects Voltaire's

¹ *Journal de mathématiques pures et appliquées*, series 1, vol. 16, 1851, pp. 137ff.

² No. 1 of this series, 1921, 64-65.

name with the science of mathematics. Perhaps it should be so, since the candle that he placed at the altar of science was dimmed by the great lights which he set before his shrines erected to literature and to political justice. And yet there was no man living in France in his time who did so much to make the philosophy of Newton known to the literati of Paris as this same Voltaire. He knew few of the details of mathematics, but he had read and admired the *Principia*, he had caught the spirit of the work, and he wished to bring this spirit to the attention of the literary world of France. No one could have done this so successfully as he, because, while half the literati hated him, all read his every written word. He first came really to know England when Newton was dying. He visited the niece, Mrs. Conduitt; from her learned the story of Newton and the apple; and twice repeated this story in his works. He was at Newton's funeral in Westminster Abbey, and one of his biographer's remarks, "When Voltaire was very old it is said 'his eye would grow bright and his cheek flush' when he said that he had once lived in a land where 'a professor of mathematics, only because he was great in his vocation,' had been buried 'like a king who had done good to his subjects.'"

He knew Maupertuis, and despised him; knew Koenig, "a very good mathematician and a very dull man," and became his champion; knew D'Alembert, and worked with him on the *Encyclopédie*; and knew—too well—the Marquise du Chastellet and assisted her on her *Principes Mathématiques de la Philosophie Naturelle*.

His own work on Newton's philosophy (*Elémens de la Philosophie de Newton*) contains but little mathematics. It appeared twice in the same year (1738), in Amsterdam and in London, and made Newton's mathematics known to others if not to its author.

Among my autographs are two letters written by Voltaire. One refers to his *Oreste* which appeared in 1749 and was apparently written about that time. It begins in the style that Houdon had in mind when he chiseled the well-known bust that looks at the visitor when he walks through the foyer of the Théâtre Français,—

The old invalid of Ferney has written a very consoling letter to friend Pankouke, but the true consolation consists in having many purchasers.

The good old man is well aware that there should be a modification of the last scene of *Oreste*,—[and so on, with a closing line]

Ut ut est, mille amitiés.

Voltaire delighted to speak of himself as "the old invalid of Ferney." He was always ill, and always at work. For half a century he was dying, and finally passed away at the age of eighty-four, with intellect clear and with pen as vitriolic as ever.

Pankouke (to take Voltaire's spelling) was his publisher. *Oreste* had not been a financial success. He had changed and changed it during its short life on the stage, until one of the actresses rebelled and declined to receive Voltaire or his letters. The story goes that he finally sent her a pâté of partridges for a dinner she was giving,—and each partridge held in its beak a note containing changes in her rôle!

The second letter was written at Ferney on April 30, 1766, and is addressed to M. le Chevalier de Taulès. Voltaire was then seventy-two years old and his

handwriting had begun to show the advancing years; but his pen had not lost its cunning nor had his sarcasm begun to fail. It is, like others of his earlier years, a plea for human rights,—this time for two men in prison in Geneva.

“I do not know the rubrics of the city of Calvin—and I do not wish to know them! Twenty citizens have come to see me, as once the fishwives of Paris paid me a similar honor. I prepared for the latter a little compliment for the King, which was well received; and I did the same for these citizens, but this has not been received in similar fashion. It appears that certain gentlemen of twenty-five are greater seigneurs than the King. I did not know that fishwives had greater privileges than such citizens; but I ask your protection for these poor devils who know only that they exist. I do not speak of the ‘perruques quarrées’ but of these native citizens.”

This is not mathematical; it is not the letter of a mathematician; but it gives a personal view of a man who did something for mathematics and everything that man could do in the middle of the eighteenth century for human liberty.

QUESTIONS AND DISCUSSIONS.

EDITED BY W. A. HURWITZ, Cornell University, Ithaca, N. Y.

NEW QUESTION.

The discussion below by Professor Bradley leads to the request for consideration by readers of the MONTHLY of the following question:

45. Is every non-trivial solution in integers of the equation $t^3 = x^3 + y^3 + 1$ expressible in the form $x = 9r^4 - 3r$, $y = 9r^3 - 1$, $t = 9r^4$? If there are non-trivial solutions not expressible in this form, can a general solution be found?

REPLIES.

30. (1916, 88, 354; 1920, 114, 362; 1921, 124). A certain Normal University wishes to offer thirty-five hours of college mathematics for the benefit of high school teachers. What should these courses be in order that, primarily, they may be of the greatest value to high school teachers of mathematics and, secondarily, that they may furnish stimulus for a more extended pursuit of the subject?

REPLY BY T. G. RODGERS, New Mexico Normal University.

It is disappointing that the above question has not called forth a full and varied discussion from which, at least, a certain minimum of essential courses might be agreed upon. Such a discussion would be of great value to a certain class of institutions and the secondary schools with which they are closely associated.

Readers of the MONTHLY may have considered that the replies to Question 31 (1916, 395–399), included the above. These excellent articles gave existing conditions in standard colleges and universities but had no reference to normal schools.

Until comparatively recent years no professional training of college rank for the benefit of secondary teachers of mathematics existed in this country and the normal schools confined their efforts to the training of teachers for the grades. At present, as the above replies point out, many colleges, especially the universities with large graduate departments, offer some courses designed primarily for teachers of secondary mathematics. The normal schools which are collegiate institutions, but not graduate institutions, are gradually teaching other college subjects besides their traditional two years of professional training for teachers of the grades.

The colleges and universities, however, though offering courses in the teaching of subjects, put the emphasis upon the development of an atmosphere conducive to the pursuit of scholarship and research rather than good teaching, while the normals lay the emphasis upon the development of enthusiasm for good teaching rather than for research. The universities supply the teachers for the large high schools which can afford to pay for graduate training; the normals supply the